Volunteer Lake Assessment Program Individual Lake Reports

FRENCH POND, HENNIKER, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	486	**Max. Depth (m):**	12.3	**Flushing Rate (yr^{-1}):**	1.2
Surface Area (Ac.):	41	**Mean Depth (m):**	4.3	**P Retention Coef:**	0.65
Shore Length (m):	1,600	**Volume (m^3):**	727,500	**Elevation (ft):**	543

TROPHIC CLASSIFICATION

Year	Trophic class
1997	EUTROPHIC
2006	EUTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

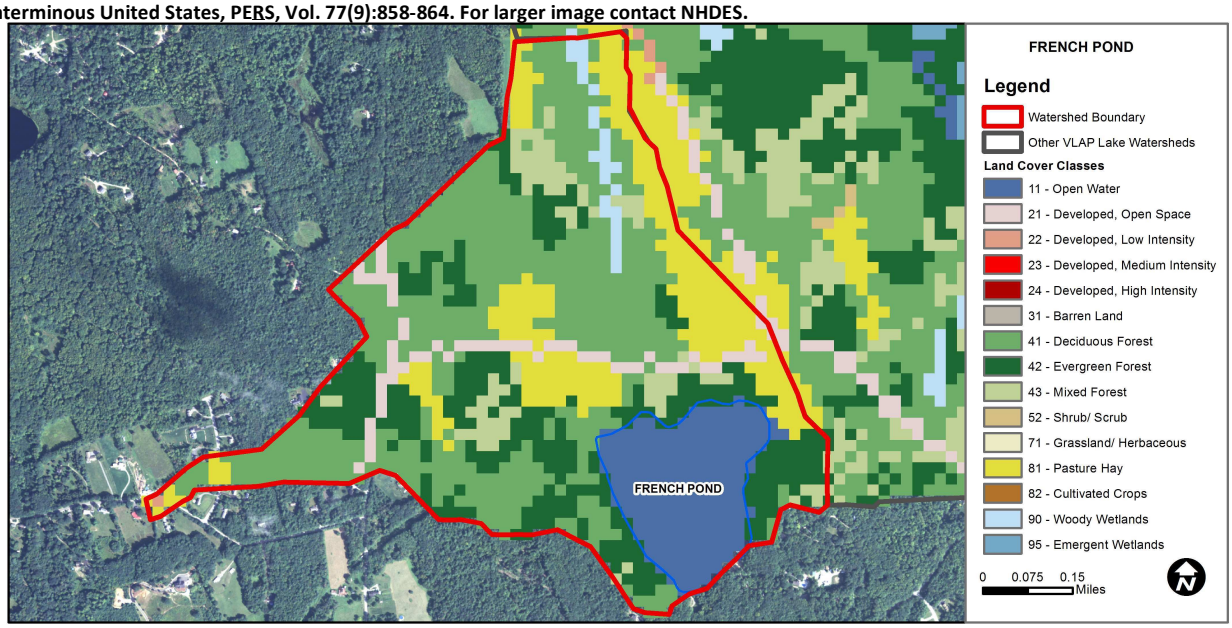
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).

BEACH PRIMARY CONTACT ASSESSMENT STATUS

FRENCH POND - PUBLIC ACCESS	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
FRENCH POND - PUBLIC ACCESS	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



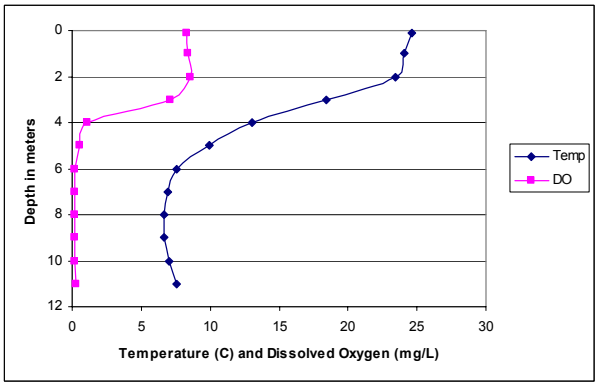
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	12.4	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	4.24	Deciduous Forest	38.7	Pasture Hay	16.03
Developed-Low Intensity	0.07	Evergreen Forest	20.41	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	5.65	Woody Wetlands	1.77
Developed-High Intensity	0	Shrub-Scrub	0	Emergent Wetlands	0

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
FRENCH POND, HENNIKER, NH
2012 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphic)*

- **CHLOROPHYLL-A:** Chlorophyll levels were much greater than NH lake median and indicative of algal/cyanobacteria bloom conditions. Historical trend analysis indicates chlorophyll levels fluctuate from year to year.
- **CONDUCTIVITY/CHLORIDE:** Conductivity levels were elevated, particularly in Launch Brook likely due to road salting.
- **E. COLI:** E. coli levels at the Swim Area were much less than state standards for public beaches and surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic (upper water layer) and metalimnetic (middle water layer) phosphorus levels were slightly above average. Historical trend analysis indicates epilimnetic phosphorus levels fluctuate from year to year. Hypolimnetic (lower water layer) phosphorus levels were elevated and dissolved oxygen levels were zero indicating an internal phosphorus load from the lake sediments. Phosphorus levels in Launch Brook were elevated, but turbidity was also elevated indicating potential sediment impacts.
- **TRANSPARENCY:** Transparency was much better than that measured from 2006 – 2010, but lower than the NH lake median. Historical trend analysis indicates a significantly decreasing (worsening) lake transparency.
- **TURBIDITY:** Turbidity was elevated at all stations and was likely due to an algal/cyanobacteria bloom throughout the lake and low tributary flows.
- **PH:** pH levels were lower than desirable in the metalimnion and hypolimnion. Epilimnetic pH was slightly higher due to the algal/cyanobacteria bloom and release of photosynthetic by-products.
- **RECOMMENDED ACTIONS:** Increase monitoring frequency to three times per summer to better assess average summer water quality and historical trends. Monitor the pond closely for cyanobacteria blooms. Reduce watershed phosphorus loading utilizing stormwater best management practices where possible. Look at options to address the hypolimnetic phosphorus load in the future.

Dissolved Oxygen & Temperature Profile



French Pond Phytoplankton Population

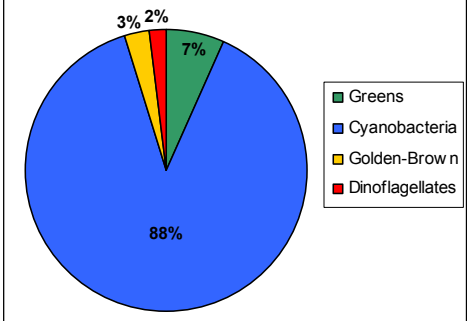


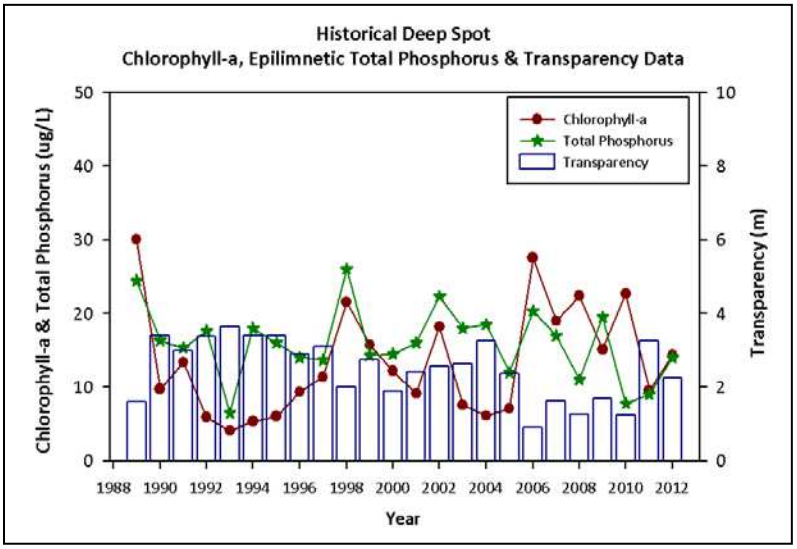
	Table 1. 2012 Average Water Quality Data for FRENCH POND								
	Alk.	Chlor-a	Cond.	E. Coli	Total P	Trans.		Turb.	pH
Station Name	mg/l	ug/l	uS/cm	#/100ml	ug/l	m		ntu	
						NVS	VS		
Campground Swim Area				2					
Deep Epilimnion	10.4	14.4	111.1		14	2.25	2.25	6.65	7.33
Deep Metalimnion			109.0		23			2.50	6.16
Deep Hypolimnion			132.2		170			19.2	6.26
Launch Brook			191.5		37			6.25	6.75
Outlet			112.0		15			5.89	6.71

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation
Chlorophyll-a	Variable	Data fluctuate annually, but are not significantly increasing or decreasing.
Transparency	Degrading	Data significantly decreasing (worsening).
Phosphorus (epilimnion)	Variable	Data fluctuate annually, but are not significantly increasing or decreasing.



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